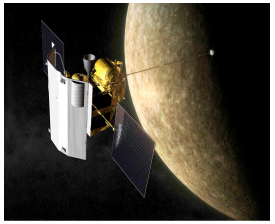
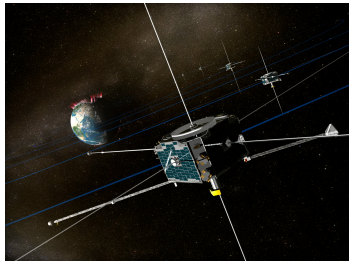
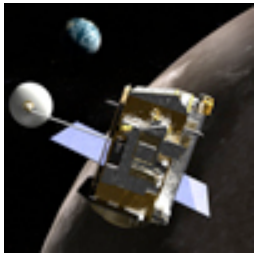
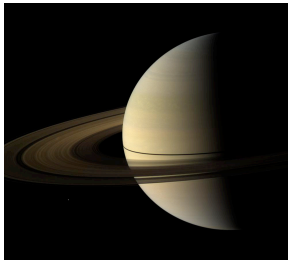
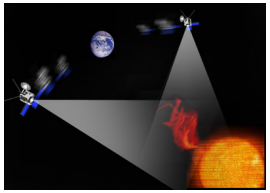
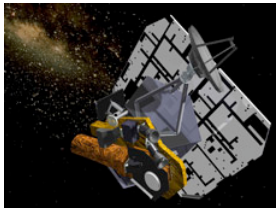
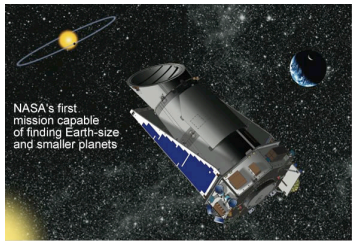





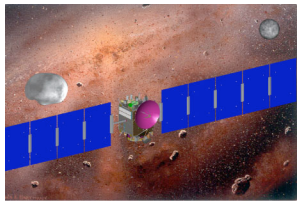
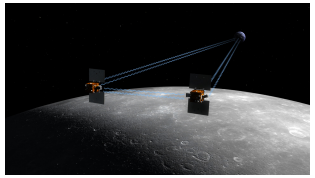
DSN Mission Schedule Process Retreat

Susan Kurtik

10 December 2009



Agenda

TOPIC	START TIME	END TIME
Coffee and Refreshments	8:30	8:45
Schedule Priorities	8:45	9:30
Schedule Request: Flexibilities & Constraints	9:30	10:30
Schedule Locking	10:30	11:00
Schedule Reporting Tools	11:00	12:00
SPS/S3 Delivery Schedule / Mission Transition Plan	1:00	2:00
Schedule 7-Day File Output Format Review	2:00	3:00
Reason for change and decommit legacy formats.		
Explain new parameters and missing fields.		
Mission Feedback on changes		
Open Discussion	3:00	4:00
Deep Space Operations Center Tour (SFOF, DarkRoom), meet the DSN teams	4:00	4:15

FORUM BACKGROUND

DSN Planning and Scheduling Service

- DSN Scheduling Process Owner (new position in DSN), responsible for:
  - DSN end-to-end planning and scheduling service
  - Defining the process across the lifecycle, from long-range forecasts through real-time scheduling
  - Conflict resolution where management coordination is necessary
  - Planning the deployment of the new DSN SPS Service Scheduling Software (SSS)

DSN Planning and Scheduling Service

- Goals for new scheduling software and process include:
  - Better utilization of the assets that we have – reduce the white space even further by finding ways to enable the missions to use the time more optimally
  - Balancing the needs of different missions against DSN finite resources, providing insight into why missions are requesting services and impact if requests are not supported
  - Less manual effort for missions to schedule use of DSN assets
  - Moving to service-based interface, which does not require missions to know internals of DSN to request tracking services
  - Unifying across planning lifecycle, from real-time to long-range
- Current status
  - Completed catchup plan and incorporated process improvements in daily operations
  - Developing a plan with the missions for transitioning to SSS and the changing mission interface

Impact of DSN Scheduling Process

- DSN scheduling drives mission sequencing timelines (longer term vs shorter term planning)
- DSN scheduling affects mission budgets directly via cost of the scheduler
- "Late" changes to the schedule require missions to rework activities that have already been planned
- DSN schedule file output impacts mission planning software and real-time flight operations
- Missions need to be able to see the schedules and understand any issues that remain in their schedule requests
- Missions need to be able to design their critical events at times when adequate assets are available

SCHEDULE REQUESTS: SCHEDULING PRIORITIES FLEXIBILITIES AND CONSTRAINTS CONFLICT FREE PHASE

Criteria for Tracking Requests

- What is the mission driver for your tracking requests?
- Are you adhering to your original predictions when the service agreement was signed? Should we track that?
- How do you define full vs minimum mission success criteria and how (if at all) are your tracking requests related to those criteria?
- Is there a common language across missions?
- How are your tracking requirements related to your project's risk policy (for eg., do requirements include margin to accommodate lost data)?

Questions for Missions

- Should we modify the current scheduling priorities or are they fair to the diverse mission needs?
- Priorities are not enforced by S3 or the process today, they are for information in the negotiation process. Should they be enforced?

Scheduling Priorities

0. **Station Failure in real-time**
1. **Spacecraft emergency, Determined in real time**
2. **Mandatory for achievement of primary objectives. Support essential to spacecraft survival, Uplink to reset critical systems, launch, planetary orbit insertion**
3. **Major, unique scientific event, Time critical. Planetary encounter, major unforeseen scientific event**
4. **Minimum DSS maintenance. Minimum support to maintain science validity, Critical maintenance, short spans of data acquisition to assure data continuity**
5. **Mandatory for achievement of primary objectives, Not time-critical. Certain TCMs*, included spacecraft health and condition monitoring, planet astronomy**
6. **Time-critical events not essential to primary mission objectives. Includes radio astronomy**
7. **Repeated scientific opportunities, Not time critical. Improvement upon minimum science return, includes host country radio sciences**

*Trajectory Correction Maneuvers (TCMs) fall into two categories:

(1) TCMs that are constrained to a particular time may be considered Priority 2, e.g., Injection into planetary orbit

(2) TCMs that offer more flexibility in planning are considered Priority 5. In this instance, projects are expected to make every effort to avoid conflicts by coordinating their plans

Schedule Request Flexibilities

- Missions need to define flexibilities and constraints associated with a schedule request
- Policy on flexibilities
- What is it based on? Minimum to full mission success criteria?
- When should it be applicable in the process?
- Who should be able to know it?

Unresolvable Conflict Resolution

- What is the process when black smoke comes out the chimney? (schedulers not able to resolve within flexibilities and constraints)
- What is the role of the scheduler in the negotiation process?
- What is the role of the mission ops manager, navigator, project manager?
- Should we modify the current escalation process?
- How do we coordinate across different missions and balance the different operational paradigms of our missions?
- Should missions be required to explain their requests to other missions?
- Under what conditions should a mission give up a track?

Conflict Free Phase – Locking Tracks

- Scheduling Phases
  - When do we lock tracks or freeze the schedule?

Schedule Process Re-engineering

- How do we communicate and make decisions on changes to the process?

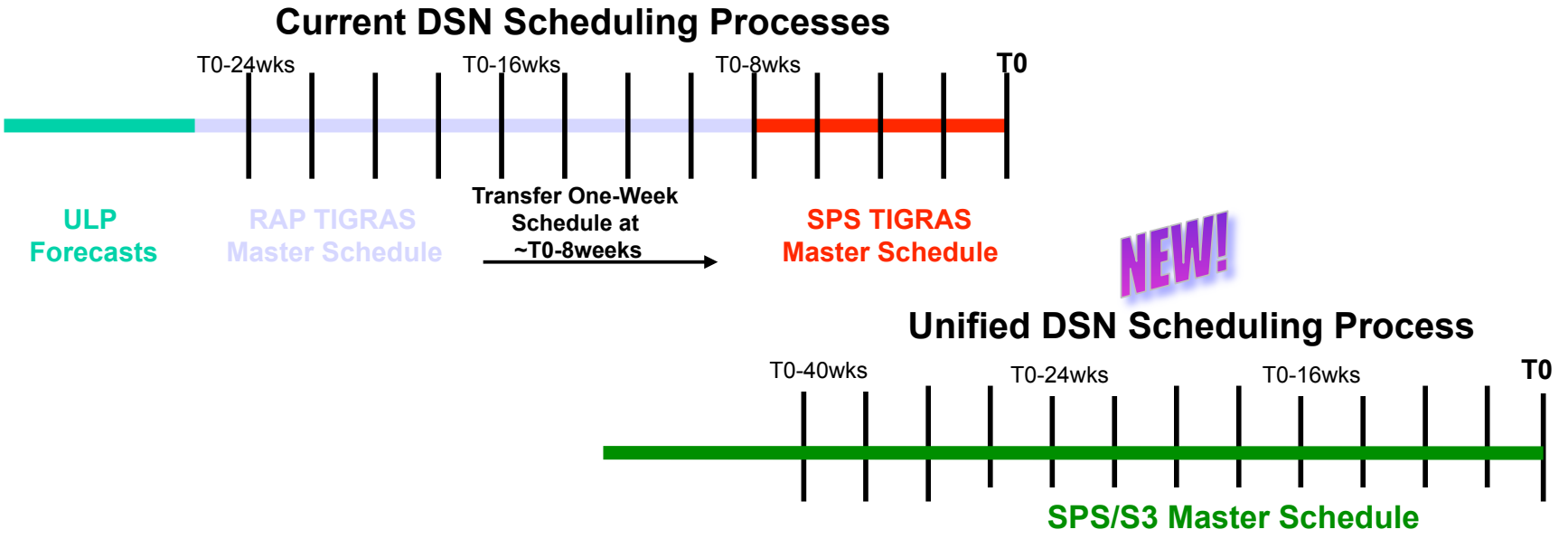
DSN Policy on Spacecraft Emergencies

- A spacecraft emergency is defined as any anomalous spacecraft or mission condition that requires immediate and unrestricted access to DSN resources to prevent the imminent failure of the mission, a significant and permanent degradation of spacecraft capabilities, a loss of one or more prime mission objectives, or the loss of a unique, demonstrably very high value science opportunity.
- Each Project Manager (or designee) is responsible for establishing the technical and operational criteria for determining spacecraft emergencies, and is the single point of authority for declaring that an emergency exists.
- The DSN will respond to a declared spacecraft emergency by immediately rearranging the operational schedule and providing the resources required to support the emergency. If a resource is supporting a level 1 critical activity, that resource will not be reallocated to emergency support without the explicit approval of the Project Manager or designee.
- Conflicting projects will accommodate emergency support requests by expeditiously terminating their activities and relinquishing the required resources. If a conflicting project is executing a level 1 critical activity, but obviously can aid the spacecraft in emergency by relinquishing a DSN resource, it should do so upon approval by the Project Manager or designee.
- The DSN Operations Chief will notify all affected projects.
- A declaration of a spacecraft emergency will not be used solely to obtain DSN support that would not be available through the normal Resource Allocation Planning & Scheduling process.
- If an emergency continues beyond 24 hours, the Project Manager will provide a written assessment to the DSN Program Manager, the DSN Development, Operations and Services Program Office Manager, and the DSN Operations Manager. The assessment will include an estimate of duration and impact if emergency support is not continued.
- The Ops Chief will bring up additional resources to support the emergency. The DSN response time shall not exceed 2 hours, where the response time is defined as the time between the release of the antenna in use and being on-point and ready to begin emergency spacecraft acquisition.

SCHEDULING OVERVIEW

Service Scheduling Software (S3) Overview

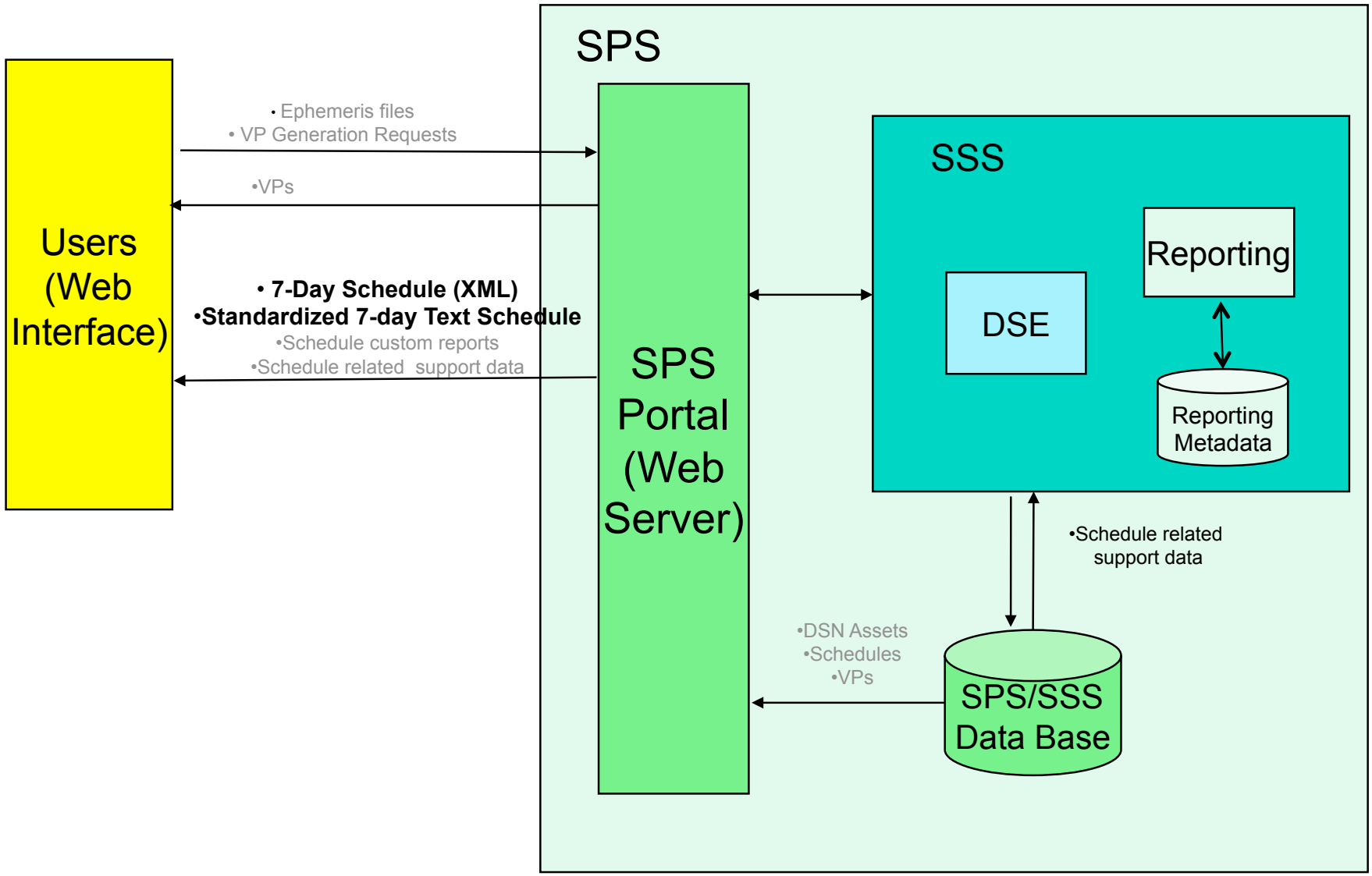
- S3 will provide the scheduling function for the Deep Space Network (DSN), including:
  - Generation of DSN Schedule from service-based “flexible” tracking requests
    - Production of operational schedules
      - Method to input generic requests, including flexibilities and constraints
      - Supports conflict identification and resolution, custom report generation, launch contingencies, and real-time changes
      - Schedules based on what services are required
  - One Master Schedule Database, one Portal, and one integrated process to cover all ranges of the DSN Scheduling Process, from real-time through long-range



S3 Schedule Generation Overview

- **DSN Schedule Generation and S3 Database**
  - **S3 Database** contains all schedule requests, tracks, change history, tables, workspace, schedules
  - **On-line request editor** to define 'service-based' schedule requests with constraints/flexibilities (aka Requests and Constraints Language (R&CL))
    - No config codes, S3 figures out what equipment is required for track
  - **DSN Scheduling Engine (DSE)** to generate schedules from requests
  - **Private user workspaces** for pulling copy of Master Schedule, generating requests and tracks, and pushing modified user workspace to Master
    - Requests are elaborated into actual tracks in local workspace under user control. Locking track attributes is possible
  - **Interactive schedule displays** with conflict visualization
  - **Collaborative environment** for peer-to-peer negotiation and conflict resolution by affected users
- **Schedule Outputs and Custom Report Generation**
  - **User tools for generating customized reports**, including metrics, change history reports, conflict reports, timeline plots
  - **New, standardized text format** for DSN 7-day schedule file

DSN Scheduling System in SPS/SSS V2.0



Service Request Terminology

- DSN Master Schedule is a set of tracks with attributes (time, resources, mission, etc) and Associated Requests
- Tracks are generated from 'Schedule Requests'
  - Requests can only by submitted by authorized mission representative
  - Requests can be submitted for any time period
- Two types of Schedule Requests
  - **"Fixed"** requests (with specific BOT/EOT, station resources)
  - **"Flexible"** requests ("service-based" using definition language to convey general requirements, constraints and flexibilities for the request. *"fixed" is a special case of "no flexibilities"*)
- Generating or modifying schedule requests
  - Use the **Schedule Request Editor (SRE)** on S3 web user interface
  - User can generate XML batch-type file in R&CL interface defined in OPS-6-12 Rev F (complicated)

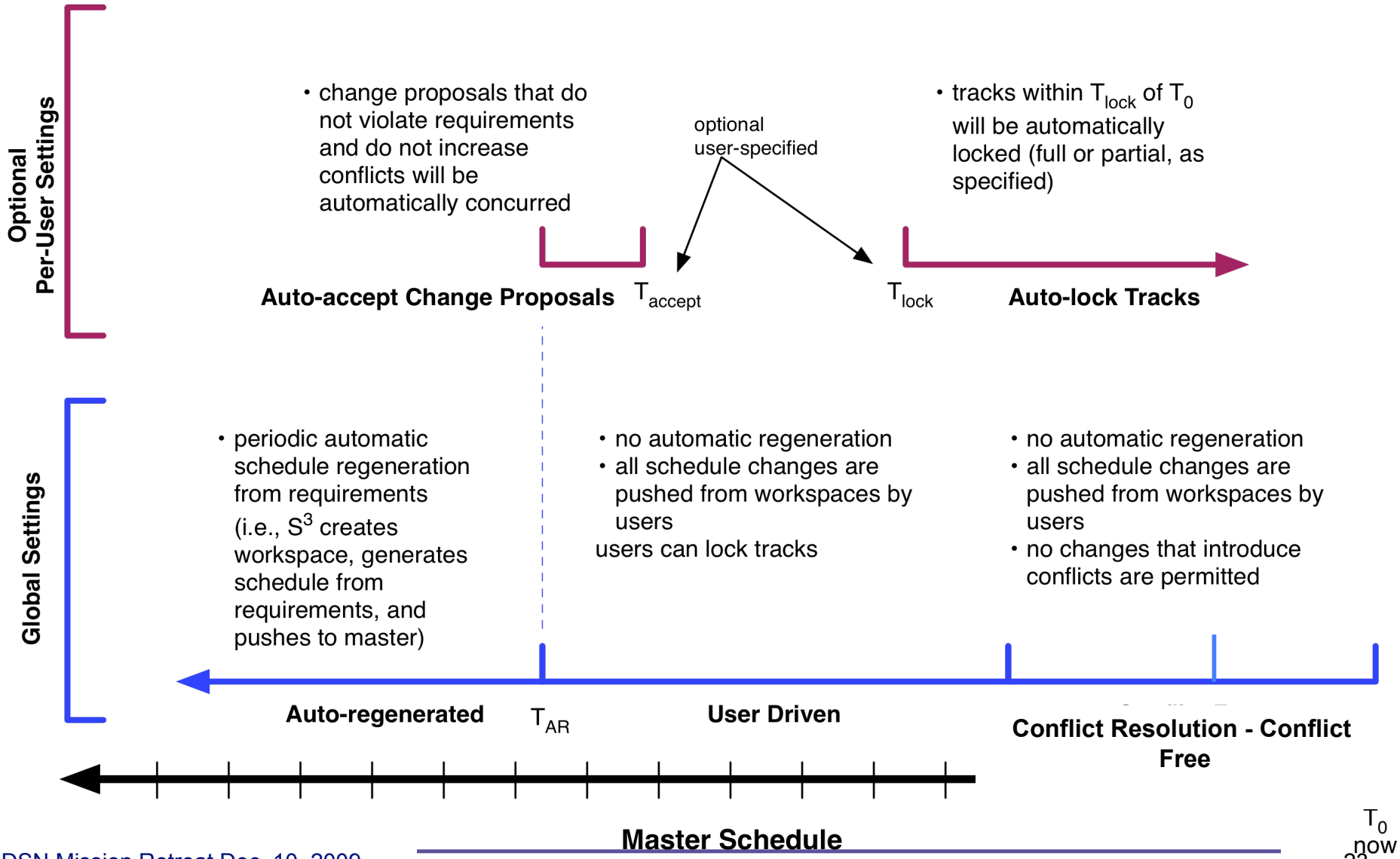
Service Requests ➔ Tracks

- S3 Scheduling Engine *elaborates* "Request" into "Tracks" (with one to many mapping options)
  - Tracks always maintain association with its Source Request
- "Locking Tracks" is process for missions to ensure that schedule has completed 'negotiations" and can plan sequences as required
  - Locked tracks will not be changed, moved or deleted from the schedule, except by an authorized user
- Locking works on Track "attributes"
  - Users can **lock some or all attributes (time, station, service, etc)**
  - If **all** attributes are locked, then it is the same as "**locking the track**"
  - Locking a track with conflicts is not forbidden, but then it remains a conflict
- Design Principle for Scheduling Engine Success: Users should maintain maximum flexibility as long as possible and lock only attributes that must be locked to achieve mission goals
  - For example, a mission may need to lock BOT and EOT but can stay 'flexible' with respect to DSN station
  - More difficult for DSE to identify conflict-free solutions if users lock too many attributes too early
- Locking a track doesn't prevent a user from editing/overriding locks for their own tracks, but S3 will not accept schedule updates with conflicts after xx weeks. User must resolve before pushing to Master

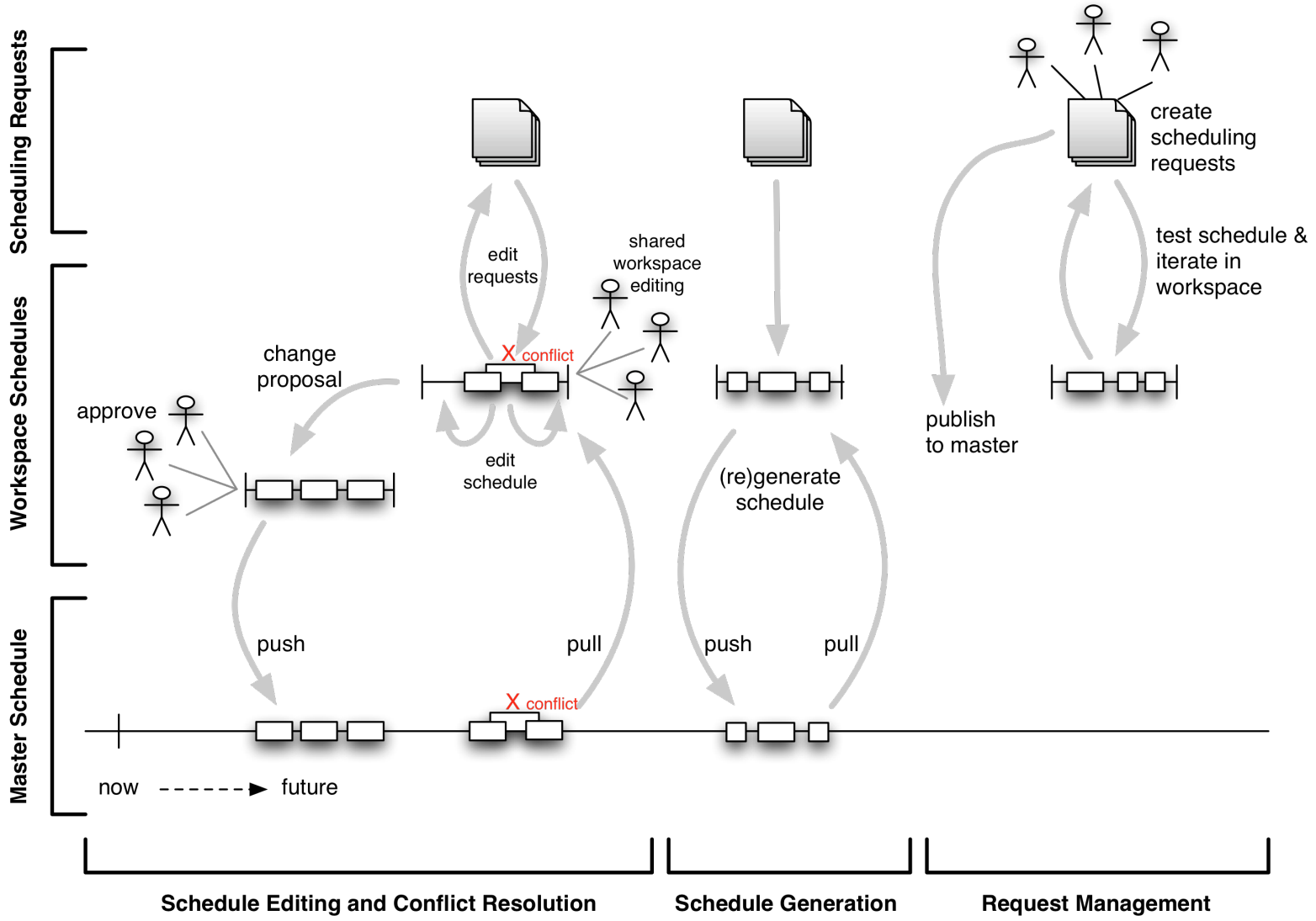
Phases of the S3 Database

- Auto-Generation Scheduling Phase: (Forecast, 6 months to xx years)
- S3 Master Schedule is automatically generated from flexible schedule requests (no conflict resolution or locking tracks). No time limit
- User-Driven Scheduling Phase: (No automatic changes to Master)
- S3 Master Schedule is changed *only* via requests from authorized users, conflicts are allowed without requiring resolution prior to submission. Tracks are generated in user workspace and pushed to Master.
- Conflict Resolution Scheduling Phase: (No new conflicts)
- S3 Master Schedule is changed via authorized user requests, but tracks that introduce new conflicts will be rejected by the system
- Pre-existing conflicts must be negotiated between peers and proposals approved prior to pushing requests to Master
- Conflicts remaining at T0 + x weeks will be escalated for resolution
- Conflict Free Scheduling Phase: (No conflicts)
- S3 Master Schedule operates the same as above, via authorized user requests and with no conflicting tracks

Schedule Phases and S3 Control Settings



S3 Use Case for Scheduling Functions (V1)



SPS/SSS DELIVERY PLAN

SPS/S3 Delivery Overview

- S3 Software Requirements Peer Review — June 30, 2009 (DONE)
- SPS/S3 Assembly Design Peer Review — July 24, 2009 (DONE)
- Standardized Schedule File Format – Ops-6-12 — Nov-Jan 2010
- S3 Software Delivery includes:
  - Unified S3 Database, Schedule Requests (R&CL Language), Conflict Resolution, Report Generation, User Collaborative Environment
- DSE Tool allows generation of schedules from flexible schedule requests, goal is to ensure that user "Request and Constraints (R&CL)" Language can capture requirements
  - Initial DSE Release v0.0 — Feb 2009 (DONE)
  - Pilot DSE Release v0.1 (R&CL editor) — July 2009 (DONE)
  - Pilot DSE Release v0.2 — Nov 2009 (DONE)
- S3 Database - Engineering Release
  - S3 Eng Release v0.3 (GUI, collaboration) — Feb 2010
  - S3 Test Readiness Review (TRR) — July 2010
- S3 V1.0 DSN Delivery Review (DDR) — Aug 2010
- SPS/S3 V2.0 DSN Delivery Review (DDR) — Jan 2011

S3 Deployment Option

- Evaluating incremental delivery/deployment approach to enable early user transition to new scheduling interface
  - V1.0, delivery of standalone S3 scheduling functions in Aug 2010
    - Transition mid-range and near-term processes to S3
    - Replaces RAP/SPS for scheduler's input, adds collaborative environment and master schedule database
    - Maintains SPS/TIGRAS only for real-time (DSN operations only)
    - Maintains current format of 7-Day Schedule File output on SPS
  - V2.0, integrated delivery of SPS/S3 with full capability in Jan 2011
    - Transition DSN real-time operations process, integrate with SPS
    - Transition 7-Day Schedule File to new OPS-6-12 Ref F
- Advantages:
  - Ensures early success with transition for midrange and near-term process
  - Provides later transition for new Schedule File Output
  - Offers lower risk by maintaining DSN real-time operations interfaces

V1-V3 Features

What's in V1:

- Schedule request entry & editing
- Schedule request expansion to tracks (automatic and interactive), conflict detection & resolution, requirement violation and resolution, equipment scheduling
- Schedule visualization and editing
- Master schedule, private workspaces create, manage, filter, pull/push from/to master as authorized; save point create/restore/delete
- Change proposal submission, concurrence/ rejection
- Integrated user-to-user and multi-user chat, file sharing, wiki integration, status and notification
- Viewperiods, mission, and asset data all from SPS 1.2 (no SPS redelivery required; no viewperiod file interface)
- Pre-defined and ad hoc reporting
- Schedule export in DRAGON XML and raw formats
- Schedule request and event *import* as proposed in the OPS 6-12 Rev F update currently in review
- Runs on SPS Portal, as a separate web application

What's in V2, V3:

- Fully integrated database
  - requires SPS 1.3 [V2]
  - means some significant workarounds will be required as interim until V2
- Use of S^3 for real-time scheduling
  - Late schedule changes will be managed with SPS TIGRAS in SPS and then manually ported back to S^3
- OPS 6-12 updated schedule format [V2]
- Some user controls (service configurations, conflict selection) [V2]
- Administrative and monitoring consoles & GUIs, including asset availability [V2, V3]
- Email notifications [V2]
- Event-triggered reports [V2]
- Schedule data archiving [V3]
- ULP reports [V3]
- Web services [V3]
- PKI security infrastructure [V3]

DSN OPS-6-12, REV. F
SSS SCHEDULE FILE OUTPUT

Thanks to contributions from many, including Julia Bell, Mark Johnston, Shan Malhotra, Christine Chang, Yeou-Fang Wang, Tung Bui, Paul Wolgast, SPS Team

Schedule Interface Changes for Missions

- OPS-6-12 Rev F documents schedule formats for users to interface with the DSN in the SPS/S3 era
- For S3 Schedule Request Inputs:
  - Schedule requests are submitted to the DSN via SPS/SSS Request Editor which translates into “Request and Constraint Language, R&CL”
  - Schedule requests can be programmed by users and imported via ‘batch input files’ (not expected to be common practice)
- For S3 Schedule File Output:
  - New schedule fields are added to an SSS schedule to support new features
  - Some items are no longer relevant in the S3 era

DSN Standard Schedule Output File

- DSN is updating the SPS 7-Day Schedule File Format (OPS-6-12 Rev F), output by the new S3 scheduling system
  - XML Format (for software ingest)
  - ASCII Text Format (subset of XML records)
  - Data is extracted from S3 Master Schedule, stored as files on SPS portal
- S3 reporting tool allows users to customize the text format of output schedule files to meet their mission needs *(retreat discussion)*
- New contents in S3 7-day schedule, some old items are no longer valid
  - Service lists rather than configuration codes (equipment lists)
  - Associations (MSPA, DDOR, etc) link individual schedule items
  - View Period information
  - Level of Support
  - Schedule priorities assigned per request
  - Each schedule item is assigned unique ID (ID_xxxxx)
  - Expanded description and comment fields

How the Schedule Format Can Be Used

Machine data	Application/Translator	Human experience

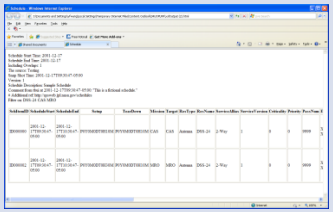
XML

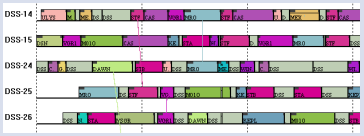
Style sheet

Readable format

Software

Display





Schedule File XML Format – What's New?

- Output can be a result of filtering by Antenna and Mission
- BOA, BOT, EOT, EOA are now expressed in full year, month, day, minute, second, DOY
- Setup and Teardown also provided
- Service Alias, Service list, equipment list
- Level of support
- Association that links all involved tracks
- SOE info is now extended to provide mission Sequence ID, mission Sequence Name, and explicit SPS Sequence ID for 0211
- Work Category code and short name
- View Period info
- Request Priority
- Support Data Package info
- Requirement reference

Schedule File Text Format – What's New?

- All date are present in year, DOY, minute, second
- Filter info: mission and antenna
- Schedule Item ID
- Level of Support
- Request Priority
- WorkCat with code and short name
- SOE info: mission Sequence ID and mission Sequence Name
- Service Alias and Service list
- Association information

Required Schedule Fields in the SSS Schedule XML Schema (1 of 6)

Required Schedule Fields (per SPS Service Scheduling FRD, Rev. A)	Legacy 7-day Schedule	Today XML Schedule	SSS XML Schedule Output
DOY	Yes (3 digits)	Yes (3 digits)	No (covered by BOA)
BOA	Yes (HHMM)	Yes (Universal date format; YYYY-MM-DDTHH:MM:SS)	Yes (Universal date format; YYYY-MM-DDTHH:MM:SS; ItemStart)
BOT	Yes (HHMM)	No	No (BOA-Setup=BOT)
EOT	Yes (HHMM)	No	No (EOT+Teardown=EOA)
EOA	Yes (HHMM)	Yes (Universal date format; YYYY-MM-DDTHH:MM:SS)	Yes (Universal date format; YYYY-MM-DDTHH:MM:SS; ItemEnd)
Setup time	No (BOA-BOT=setup)	Yes (HMM)	Yes (duration data type; Setup)
Teardown time	No (BOA-EOT=teardown)	Yes (HMM)	Yes (duration data type; Teardown)

Required Schedule Fields in the SSS Schedule XML Schema (2 of 6)

Required Schedule Fields (per SPS Service Scheduling FRD, Rev. A)	Legacy 7-day Schedule	Today XML	SSS XML Schedule Output
Antenna ID (facility)	Yes (DSS-nn or SPC-nn)	Yes	Yes (string; included in Service)
S/C or experiment's name or project	Yes (5 chars)	Yes	Yes (string; in Mission)
Comment	No	Yes	Yes (CommentsType; Comments)
Activity description	Yes (up to 16 characters)	Yes	Yes (string; Description)
Config code	Yes (nnnn)	Yes	No
Pass number	Yes (0000-9999)	Yes	Yes (string; PassNumber)
NIB	Yes (Use Pass # field)	Yes	Yes (string; Association/GroupLinkType)
Level of support (L1, L2,…)	Yes (2 chars)	Yes (use Critiality field)	Yes (integer; LevelOfSupport)
Configuration freeze (e.g., MCC)	No	No	Yes (string: Association/GroupLinkType)

Note: Schedule Field in blue is a new SSS schedule field

Required Schedule Fields in the SSS Schedule XML Schema (3 of 6)

Required Schedule Fields (per SPS Service Scheduling FRD, Rev. A)	Legacy 7-day Schedule	Today XML	SSS XML Schedule Output
SOE ID	Yes (One char)	Yes	Yes (included in Sequencing)
Work category code	Yes (3 chars)	Yes	Yes (string; WorkInfo/WorkCategory)
Equipment used with quantities	Yes (62 chars)	Yes	Yes (included in Service)
Requested Services	No	No	Yes (Included in Service)
Viewperiod events used	No	No	Yes (itemVP)
Associated viewperiod file used	No	No	Yes (itemVP)
Schedule request priority	No	Yes	Yes (integer; Priority)
Reference (link to external documents)	No	No	Yes (CommentsType; Comments)
Sequencing	No	No	Yes (Sequencing)

Required Schedule Fields in the SSS Schedule XML Schema (4 of 6)

Required Schedule Fields (per SPS Service Scheduling FRD, Rev. A)	Legacy 7-day Schedule	Today XML	SSS XML Schedule Output
Support Data Package linkage	No	No	Yes (SupportDataPackage)
Requirement Reference	No	No	Yes (RequirementReference)
2-MSPA with 1 UL swap	Yes (Use MCON in the activity field)	Yes	Yes (Use Association/GroupLinkType/ GroupLinkPriority element)
2-MSPA with multiple UL swap	No	Yes	Yes (Use Association/GroupLinkType/ GroupLinkPriority element)
2-MSPA with multiple downlink swap with priority	Yes (Use MCON in the activity field)	Yes	Yes (Use Association/GroupLinkType/ GroupLinkPriority element)

Required Schedule Fields in the SSS Schedule XML Schema (5 of 6)

Schedule Fields (per SPS Service Scheduling FRD, Rev. A)	Legacy 7-day Schedule	Existing XML Schedule	SSS XML Schedule Output
4-MSPA with multiple UL swap *	No	No	Yes (Use Association/GroupLinkType/ GroupLinkPriority element)
4-MSPA with multiple downlink swap with priority *	No	No	Yes (Use Association /GroupLinktype/ GroupLinkPriority element)
Array Indicator	Yes (Use activity field; up to 16 characters)	Yes	Yes (Association /GroupLinkType/ LinkageType)
DDOR flag	Yes (Use activity field; up to 16 characters)	Yes	Yes (Association /GroupLinkType/ LinkageType)
MSDOR flag	Yes (Use activity filed; up to 16 characters)	Yes	Yes (Association /GroupLinkType/ LinkageType)
MSPA+Array flag	No	Yes	Yes (Association /GroupLinkType/ LinkageType)

* Not operational supported by the SPS/SSS D1.3

Required Schedule Fields in the SSS Schedule XML Schema (6 of 6)

Schedule Fields (per SPS Service Scheduling FRD, Rev. A)	Legacy 7-day Schedule	Existing XML Schedule	SSS XML Schedule Output
MSPA+DDOR flag	Yes (Use activity field; 2 characters)	Yes	Yes (Association /GroupLinkType/ LinkageType)
MSPA+MSDOR flag	Yes (Use activity field)	Yes	Yes (Association /GroupLinkType/ LinkageType)
Contingency track indicator	No	Yes	Yes (Association /GroupLinkType/ LinkageType)

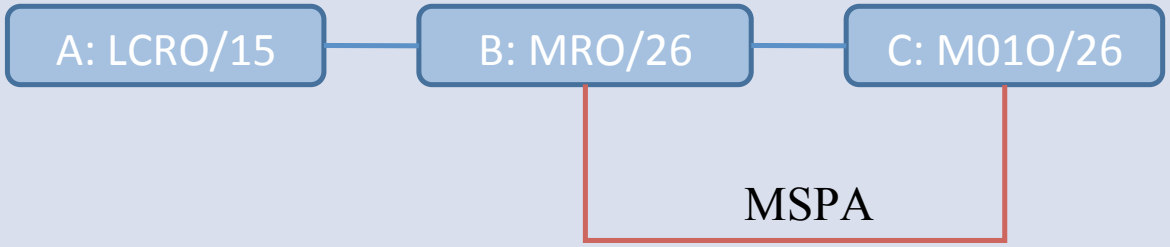
Example of the Association Links

- Allowed linkage types:
- Array, DDOR, Contingency,
- MSPA, MSDOR, NIB, MCC
- Emergency, VLBI, Three-way

Current 7-day

```
170 1305 1335 0205 0220  DSS-15  LCRO   LEOP/TCM1 TLM    0170  N030  1 1A1
170 0935 1050 2230 2245  DSS-26  MRO    MP11             0170  N002    1A1
170 1025 1055 2230 2245  DSS-26  M01O   MPX2             0170  N008    1A1
```

New Schedule XML



- Flat arrangement similar to existing 7-day structure
- Local linkage indicating B and C are in a MSPA activity

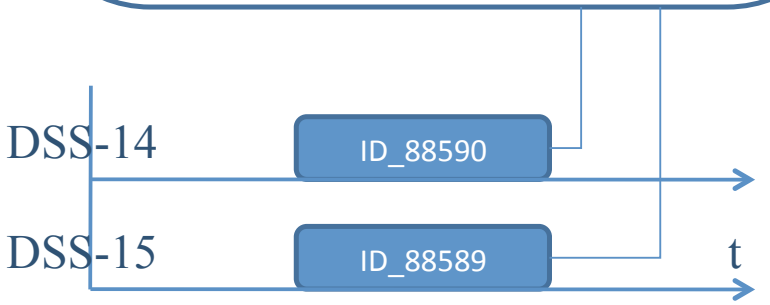
Example 1: Association

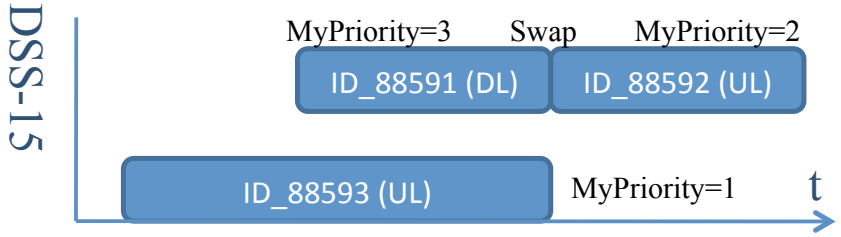
Array

```
<Association>
  <GroupLink>
    <LinkageType>Array</LinkageType>
    <Members>
      <Member>ID_88589</Member>
      <Member>ID_88590</Member>
    </Members>
  </GroupLink>
</Association>
```

MSPA

```
<Association>
  <GroupLinkPriority>
    <LinkageType>MSPA</LinkageType>
    <Members>
      <Member>ID_88591</Member>
      <Member>ID_88592</Member>
      <Member>ID_88593</Member>
    </Members>
    <MyPriority>1</MyPriority>
  </GroupLinkPriority>
</Association>
```

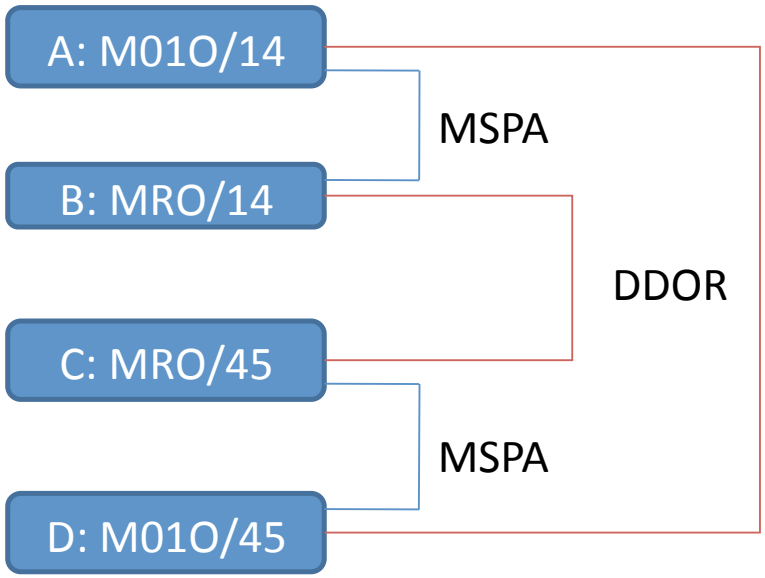




Example 2: Association

MSPA-DDOR

- 081 1230 1345 2255 2310 DSS-14 M01O MT12 DD 0081 N002 1A1
- 081 1340 1410 2255 2310 DSS-14 MRO MTX1 DD 0081 0626 1A1
- 081 1840 1955 0610 0610 DSS-45 MRO MU11 DD 0081 N900 1A1
- 081 1840 1955 0625 0640 DSS-45 M01O MUX2 DD 0081 N012 1A1




```
<Association>
  <GroupLinkPriority>
    <LinkageType>MSPA</LinkageType>
    <Members>
      <Member>A</Member>
      <Member>B</Member>
    </Members>
    <MyPriority>1</MyPriority>
  </GroupLinkPriority>
  <GroupLink>
    <LinkageType>DDOR</LinkageType>
    <Members>
      <Member>A</Member>
      <Member>D</Member>
    </Members>
  </GroupLink>
</Association>
```

S3 Custom Report Samples

By Tung Bui

Output can be similar to 7-day format (HTML)

Schedule Start Time: 2009-12-14T00:00:00
Schedule End Time: 2009-12-21T00:00:00
The source: Master
Snap Shot Time: 2009-09-25T09:30:00
Version: 1.0
Schedule Description: Example for the schema
Comment from Schema design team at 2009-09-20T09:30:00: "This schedule is just an example for the designed schema."
Additional ref: https://spsweb.fltops.jpl.nasa.gov/portalappsops/Main.do
Filter on: VGR1 M01O MRO DSN

SchItemID	ScheduleStart	ScheduleEnd	Setup	TearDown	Facility	PassNum	WrkCat	Grouping
ID_88588	2009-12-15T15:00:00	2009-12-15T18:10:00	0h30m	0h15m	DSS-63	1821	1A1	Type Priority Members
ID_88589	2009-12-15T15:15:00	2009-12-15T22:00:00	1h15m	0h15m	DSS-15	1822	1A1	Type Priority Members Array ID_88589 ID_88590
ID_88590	2009-12-15T16:00:00	2009-12-15T22:00:00	0h30m	0h15m	DSS-14	1822	1A1	Type Priority Members Array ID_88589 ID_88590
ID_88591	2009-12-18T11:55:00	2009-12-18T13:50:00	0h30m	0h0m	DSS-25	0352	1A1	Type Priority Members MSPA 3 ID_88591 ID_88592 ID_88593
ID_88592	2009-12-18T13:50:00	2009-12-18T16:25:00	0h0m	0h15m	DSS-25	0352	1A1	Type Priority Members MSPA 2 ID_88591 ID_88592 ID_88593
ID_88593	2009-12-18T08:15:00	2009-12-18T13:50:00	1h15m	0h0m	DSS-25	0352	1A1	Type Priority Members MSPA 1 ID_88591 ID_88592 ID_88593
ID_88594	2009-12-16T11:30:00	2009-12-16T13:30:00	0h0m	0h0m	DSS-54		2C1	Type Priority Members NIB ID_88594

Output can also be as complete as you want

Schedule Start Time: 2009-12-14T00:00:00
Schedule End Time: 2009-12-21T00:00:00
The source: Master
Snap Shot Time: 2009-09-25T09:30:00
Version: 1.0
Schedule Description: Example for the schema
Comment from Schema design team at 2009-09-20T09:30:00: "This schedule is just an example for the designed schema."
Additional ref: https://spsweb.fltops.jpl.nasa.gov/portalappsops/Main.do
Filter on: VGR1 M01O MRO DSN

SchItemID	ScheduleStart	ScheduleEnd	Setup	TearDown	Facility	ServiceAlias	ServiceVersion	LevelOfSupport	Priority	PassNum	Equipment	WrkCat	SDP	RequirementRef	SeqInfo	VPInfot	Grouping
ID_88588	2009-12-15T15:00:00	2009-12-15T18:10:00	0h30m	0h15m	DSS-63	VGR1 Tracking	1.0	3	3	1821	TLPA:1 NMC:1 XHMT:1 RRPA:1	1A1	SdpID:221174 DataSetID:455473	ReferenceID:03412R032 Version:006 InViolation:false	SeqStatus:Provided SoeName:A SoeRef:308802	VpStatus:Provided VpFileID:100876 VpStartEvent:Rise VpEndEvent:Set VpStart:2009-12-15T05:40:00 VpEnd:2009-12-15T17:56:00 RiseTime:2009-12-15T05:40:00 SetTime2009-12-15T17:56:00	Type Priority Members
ID_88589	2009-12-15T15:15:00	2009-12-15T22:00:00	1h15m	0h15m	DSS-15	VGR1 PB	1.0	2	2	1822	FSPA:1 TLPA:1 NMC:1 RRPB:1 XTWM:1 TLPB:1 RRPA:1	1A1	SdpID:221174 DataSetID:455473	ReferenceID:06735R055 Version:007 InViolation:false	SeqStatus:Provided SoeName:A SoeRef:308802	VpStatus:Provided VpFileID:100876 VpStartEvent:Rise VpEndEvent:Set VpStart:2009-12-15T13:14:00 VpEnd:2009-12-16T01:22:00 RiseTime:2009-12-15T13:14:00 SetTime2009-12-16T01:22:00	Type Priority Members Array ID_88589 ID_88590
ID_88590	2009-12-15T16:00:00	2009-12-15T22:00:00	0h30m	0h15m	DSS-14	VGR1 PB	1.0	2	2	1822	TLPA:1 NMC:1 XHMT:1 RRPA:1	1A1	SdpID:221174 DataSetID:454985	ReferenceID:06735R055 Version:007 InViolation:false	SeqStatus:Provided SoeName:A SoeRef:308802	VpStatus:Provided VpFileID:100876 VpStartEvent:Rise VpEndEvent:Set VpStart:2009-12-15T13:14:00 VpEnd:2009-12-16T01:22:00 RiseTime:2009-12-15T13:14:00 SetTime2009-12-16T01:22:00	Type Priority Members Array ID_88589 ID_88590
ID_88591	2009-12-18T11:55:00	2009-12-18T13:50:00	0h30m	0h0m	DSS-25	M01O DL	1.0	2	3	0352	TLPB:1 NMC:1 XTWM:1 RRPA:1	1A1	SdpID:221009 DataSetID:455247	ReferenceID:06745R066 Version:008 InViolation:false	SeqStatus:Provided SeqStart:2009-12-01T15:00:00 SeqEnd:2009-12-30T09:30:47 ProjectSoeID:Tracking SpsSoeID:100256 SessionProfileRef:309802	VpStatus:NoVP VpFileID: VpStartEvent: VpEndEvent: VpStart: VpEnd: RiseTime: SetTime	Type Priority Members MSPA 3 ID_88591 ID_88592 ID_88593
ID_88592	2009-12-18T13:50:00	2009-12-18T16:25:00	0h0m	0h15m	DSS-25	M01O UPL	1.0	2	2	0352	RRPA:1 RNG:1 TLPB:1 XTWM:1 UPL:1 NMC:1 XTXL:1 CCP:1	1A1	SdpID:221009 DataSetID:455246	ReferenceID:07865R235 Version:002 InViolation:false	SeqStatus:Provided SeqStart:2009-12-01T15:00:00 SeqEnd:2009-12-30T09:30:47 ProjectSoeID:Tracking SpsSoeID:101256 SessionProfileRef:302802	VpStatus:NoVP VpFileID: VpStartEvent: VpEndEvent: VpStart: VpEnd: RiseTime: SetTime	Type Priority Members MSPA 2 ID_88591 ID_88592 ID_88593
ID_88593	2009-12-18T08:15:00	2009-12-18T13:50:00	1h15m	0h0m	DSS-25	MRO UPL	1.0	2	1	0352	TLPA:1 RRPA:1 RNG:1 XTWM:1 UPL:1 NMC:1 XTXL:1 CCP:1	1A1	SdpID:221009 DataSetID:455275	ReferenceID:76543R345 Version:005 InViolation:false	SeqStatus:Provided SeqStart:2009-12-01T15:00:00 SeqEnd:2009-12-30T09:30:47 ProjectSoeID:Tracking SpsSoeID:101256 SessionProfileRef:308802	VpStatus:Provided VpFileID:110876 VpStartEvent:Rise VpEndEvent:Set VpStart:2009-12-16T05:10:00 VpEnd:2009-12-16T17:52:00 RiseTime:2009-12-15T05:10:00 SetTime2009-12-16T17:52:00	Type Priority Members MSPA 1 ID_88591 ID_88592 ID_88593
ID_88594	2009-12-16T11:30:00	2009-12-16T13:30:00	0h0m	0h0m	DSS-54	SECURITY SCAN	1.0	2	2			2C1		ReferenceID:67765R008 Version:003 InViolation:false	SeqStatus:Nonrequired	VpStatus:NoVP VpFileID: VpStartEvent: VpEndEvent: VpStart: VpEnd: RiseTime: SetTime	Type Priority Members NIB ID_88594

Output can be in plain text

Schedule Start Time: 2009-001T00:00:00
Schedule End Time: 2009-007T00:00:00
The source: Master
Snap Shot Time: 2009-278T09:30:00
Schedule Description Example for the schema
Filter on: VGR1
SchItemID.ScheduleStart,ScheduleEnd,BOT,EOT
Setup,TearDown,Facility,ServiceAlias,ServiceVersion,LevelOfSupport,Priority,PassNum,Equipment,WrkCat,SDP,RequirementRef,
SeqInfo,VPInfo,Grouping
ID_88588,2009-001T15:00:00,2009-0025T18:10:00,2009-001T15:30:00,2009-001T17:55:00,0h30m,0h15m,DSS-63,VGR1
Tracking,1.0,3,3,0001, TLPA:1 NMC:1 XHMT:1 RRPA:1,1A1,SdpID:6789 DataSetID:78956,ReferenceID:https://jpl.nasa.gov/
Version:2.0 InViolation:false,SeqStatus:Provided SeqStart:2009-12-01T15:00:00 SeqEnd:2001-12-30T09:30:47
ProjectSoeID:Tracking SpsSoeID:100389 SessionProfileRef:309800,VpStatus:Provided VpFileID:100876 VpStartEvent:Rise
VpEndEvent:Set VpStart:2001-12-15T05:40:00 VpEnd:2001-12-15T17:56:00 RiseTime:2001-12-15T05:40:00 SetTime:
2001-12-15T17:56:00,

SchItemID.ScheduleStart,ScheduleEnd,BOT,EOT
Setup,TearDown,Facility,ServiceAlias,ServiceVersion,LevelOfSupport,Priority,PassNum,Equipment,WrkCat,SDP,RequirementRef,
SeqInfo,VPInfo,Grouping
ID_88588,2009-001T15:00:00,2009-0025T18:10:00,2009-001T15:30:00,2009-001T17:55:00,0h30m,0h15m,DSS-63,VGR1
Tracking,1.0,3,3,0001, TLPA:1 NMC:1 XHMT:1 RRPA:1,1A1,SdpID:6789 DataSetID:78956,ReferenceID:https://jpl.nasa.gov/
Version:2.0 InViolation:false,SeqStatus:Provided SeqStart:2009-12-01T15:00:00 SeqEnd:2001-12-30T09:30:47
ProjectSoeID:Tracking SpsSoeID:100389 SessionProfileRef:309800,VpStatus:Provided VpFileID:100876 VpStartEvent:Rise
VpEndEvent:Set VpStart:2001-12-15T05:40:00 VpEnd:2001-12-15T17:56:00 RiseTime:2001-12-15T05:40:00 SetTime:
2001-12-15T17:56:00,

BOT,EOT Setup,TearDown,Facility,ServiceAlias,User
2009-001T15:00:00, 2009-001T18:10:00,0h30m,0h15m,DSS-63,Telemetry,VGR1

ScheduleStart, ScheduleEnd, Setup,TearDown,Facility,ServiceAlias,User
2009-001T15:00:00, 2009-001T18:10:00,0h30m,0h15m,DSS-63,Telemetry Command,VGR1